Amendments To The Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended): A matching network for coupling an RF power supply to an R[[r]]F antenna in a plasma generator, comprising:

a resonantly tunable circuit formed of a variable capacitor and inductor in a series resonance configuration;

a ferrite core transformer, said resonantly tunable circuit being connected to one end of a winding of said ferrite core transformer and said RF antenna being connected to another end of the winding of said ferrite core transformer.

2. (Currently Amended): The matching network of Claim 1 wherein the transformer comprises a secondary winding which couples the transformer to both the tunable circuit and RF antenna and a primary winding.

3. (Previously Presented): A matching network for coupling an RF power supply to an RF antenna in a plasma generator, comprising:

a resonantly tunable circuit formed of a variable capacitor and an inductor in a series resonance configuration:

a ferrite core transformer coupled to the resonantly tunable circuit,

wherein a secondary winding of the transformer is a single-turn winding and a primary winding of the transformer is a multi-turn winding, the secondary winding is coupled to the tunable circuit.

4. (Previously Presented): A matching network for coupling an RF power supply to an RF antenna in a plasma generator, comprising:

a resonantly tunable circuit formed of a variable capacitor and an inductor in a series resonance configuration;

a ferrite core transformer having a single-turn secondary winding and a multi-turn primary winding, and the resonantly tunable circuit being connected to the secondary winding,

wherein the transformer further comprises a core which is made of a plurality of ferrite cores.

5. (Previously Presented): A matching network for coupling an RF power supply to an RF antenna in a plasma generator, comprising:

a resonantly tunable circuit formed of a variable capacitor and an inductor in a series resonance configuration;

a ferrite core transformer having a secondary winding that couples the transformer to the resonantly tunable circuit, and also having a primary winding,

wherein the transformer further comprises a core which is made of a plurality of ferrite cores.

6. (Currently Amended): A matching network for coupling an RF power supply to an RF antenna in a plasma generator, ~~The matching network of Claim 2~~ comprising:

a resonantly tunable circuit formed of a variable capacitor and inductor in a series resonance configuration; and,

a ferrite core transformer, said resonantly tunable circuit being connected to one end of a winding of said ferrite core transformer, the one end of a winding of said ferrite core transformer being a secondary winding that couples said ferrite core transformer to said resonantly tunable circuit and said ferrite core transformer also having a primary winding,

wherein the turn ratio between the primary winding and the secondary winding ranges from 3:1 to 8:1.

7. (Original): The matching network of Claim 6 wherein the turn ratio between the primary winding and the secondary winding is selected to transform the plasma impedance of the plasma generator to 50Ω.

8. (Previously Presented): A matching network for coupling an RF power supply to an RF antenna in a plasma generator, comprising:

a resonantly tunable circuit formed of a variable capacitor and an inductor in a series resonance configuration;

a ferrite core transformer having a secondary winding that couples the transformer to the resonantly tunable circuit, and also having a primary winding,

wherein the turn ratio between the primary winding and the secondary winding ranges from 3:1 to 8:1, and the transformer comprises a core made of 12 ferrite cores with a 1.25 inch OD and 0.75 inch ID, made of M-type ferrite.

9. (Original): The matching network of Claim 8 wherein the variable capacitor has a capacity range of 5-125pF.

10. (Original): The matching network of Claim 9 wherein the network fits within a cylindrical volume 6 inches in diameter and 8 inches long.

11. (Currently Amended): A matching network for coupling an RF power supply to an RF antenna in a plasma generator ~~The matching network of Claim 1 further,~~ comprising :

a resonantly tunable circuit formed of a variable capacitor and inductor in a series resonance configuration;

a ferrite core transformer, said resonantly tunable circuit being connected to one end of a winding of said ferrite core transformer; and,

an RF power supply connected through a 50Ω coaxial cable to an input of the matching network and the RF antenna (inductive coil) connected to an output of the matching network.

12. (Previously Presented): A plasma ion or electron source, comprising:

an RF power supply;

a coaxial cable connected to the RF power supply;

a matching network having an input connected to the coaxial cable, the matching network comprising;

a resonantly tunable circuit formed of variable capacitor and an inductor in a series resonance configuration;

a ferrite core transformer, said resonantly tunable circuit being connected to one end of a winding of said ferrite core transformer;

an RF antenna connected to an output of the matching network;

a plasma ion or electron generator having the RF antenna mounted therein for inductively generating a plasma.

13. (Original): The plasma ion or electron source of Claim 12 wherein the transformer comprises a secondary winding which couples the transformer to the tunable circuit and a primary winding.

14. (Previously Presented): A plasma ion or electron source, comprising:

an RF power supply;

a coaxial cable connected to the RF power supply;

a matching network having an input connected to the coaxial cable, the matching

network comprising;

a resonantly tunable circuit formed of a variable capacitor and an inductor in a series resonance configuration;

a ferrite core transformer coupled to the resonantly tunable circuit;

an RF antenna connected to an output of the matching network; and,

a plasma ion or electron generator having the RF antenna mounted therein for inductively generating a plasma,

wherein a secondary winding of the transformer is a single-turn winding and a primary winding of the transformer is a multi-turn winding, and the secondary winding couples the transformer to the resonantly tunable circuit.

15. (Previously Presented): A plasma ion or electron source, comprising:

an RF power supply;

a coaxial cable connected to the RF power supply;

a matching network having an input connected to the coaxial cable, the matching network comprising:

a resonantly tunable circuit formed of a variable capacitor and an inductor in a series resonance configuration; and,

a ferrite core transformer having a single-turn secondary winding and a multi-turn primary winding, and the resonantly tunable circuit being connected to the secondary winding;

wherein there is an RF antenna connected to an output of the matching network; and,

a plasma ion or electron generator having the RF antenna mounted therein for

inductively generating a plasma; and,

wherein the transformer further comprises a core which is made of a plurality of ferrite cores.

16. (Original): The plasma ion or electron source of Claim 14 wherein the turn ratio between the primary winding and the secondary winding ranges from 3:1 to 8:1.

17. (Previously Presented): The plasma ion or electron source of Claim 14 wherein the coaxial cable has an impedance of 50 Ω and the turn ratio between the primary winding and the secondary winding is selected to transform the plasma impedance of the plasma generator to 50 Ω.

18. (Previously Presented): A plasma ion electron source comprising:

an RF power supply;

a coaxial cable connected to the RF power supply;

a matching network having an input connected to the coaxial cable, the matching network comprising:

a resonantly tunable circuit formed of a variable capacitor and an inductor in a series resonance configuration; and,

a ferrite core transformer coupled to the resonantly tunable circuit,

wherein there is an RF antenna connected to an output of the matching network; and,

a plasma ion or electron generator having the RF antenna mounted therein for inductively generating a plasma; and,

wherein the plasma ion or electron generator is a multicusp plasma generator.

19. (Original): The plasma ion or electron source of Claim 18 wherein the source is a part of a compact focused ion beam system.

20. (Original): The plasma ion or electron source of Claim 19 wherein the matching network fits within a cylindrical cavity 6 inches in diameter and 8 inches long.

21. (Previously Presented): A plasma ion or electron source, comprising:

an RF power supply;

a coaxial cable connected to the RF power supply;

a matching network having an input connected to the coaxial cable, the matching network comprising;

a resonantly tunable circuit formed of a variable capacitor and an inductor in a series resonance configuration;

a ferrite core transformer coupled to the resonantly tunable circuit;

an RF antenna connected to an output of the matching network; and,

a plasma ion or electron generator having the RF antenna mounted therein for inductively generating a plasma,

wherein the transformer comprises both a single-turn secondary winding that couples the transformer to the tunable circuit and a multi-turn primary winding, and the transformer further comprises a core that is made of a plurality of ferrite cores.

22. (Previously Presented): A plasma ion or electron source, comprising:

an RF power supply;

a coaxial cable connected to the RF power supply;

a matching network having an input connected to the coaxial cable, the matching network comprising;

a resonantly tunable circuit formed of a variable capacitor and an inductor in a series resonance configuration;

a ferrite core transformer coupled to the resonantly tunable circuit;

an RF antenna connected to an output of the matching network; and,

a plasma ion or electron generator having the RF antenna mounted therein for inductively generating a plasma,

wherein the plasma ion or electron generator is a multicusp plasma generator.

23. (Previously Presented): The plasma ion or electron source of Claim 22 wherein the source is a part of a compact focused ion beam system.

24. (Previously Presented): The plasma ion or electron source of Claim 23 wherein the matching network fits within a cylindrical cavity 6 inches in diameter and 8 inches long.